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ABSTRACT

This study reviews literature in which decisions were made using the Delphi method according to a decision model of Deising. This method is used to determine priorities in decision making. Examples are given of areas of study in which the evaluation criteria were social, technical, economic, legal, and political.
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COLLEGE DECISIONS
MADE BY THE DELPHI METHOD

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Abstract

The Delphi method is a Future Research method used to determine priorities. This study reviewed literature in which decisions were made using the Delphi method according to a decision model of Deising. Two case studies were reported in detail.

College Decisions Made By The Delphi Method

Credit for developing the Delphi Method is given to Olaf Helmer, Norman Dalkey and others working at the Rand Corporation. Their purpose was to forecast about the use of technology. More recently the Delphi method has been used to make educational decisions. The purpose of this paper is to review some decisions made about higher education in which the Delphi method was used.

Kinds of Educational Decisions

In a review of the literature for the Delphi method it was noted that forecasting remained as a use. The majority of the decisions were related to goals, purposes or objectives and to curricular decisions. Other uses were to determine the competencies of graduates, decisions about the university environment and learning system, evaluation and decisions about the faculty and students.

These uses were categorized according to the kinds of decisions discussed by Deising (1962) as shown in table one. Deising used the term rationality in conjunction with the terms technical, economic, social, legal, and political to describe decisions. He noted that less has been done with study of social and political rationality.

Social Rationality: Forecasting Decisions

Social rationality was described by Deising (1962) as decisions about the things people do together, such as trends, relationships, and roles. This is the forecasting

use for the Delphi method.

In Social Technology, Helmer (1966) pointed out the need for educational reform and recommended the use of the Delphi method to solicit and appraise the efficiency of ideas about education.

Helmer (1966) conducted an experiment in which the importance, desirability, and feasibility of educational innovations were investigated. Of the 93 statements derived 24 were related to colleges and universities. These were about centralization, subsidization, organizational structure, summer and evening courses, use of grades, basis for graduation, teacher education, preparation of professors, recruitment, promotion and tenure systems, evaluation, team teaching and methods of instruction.

Carvell et al (1969) forecasted occupational trends for use in planning vocational education programs. The future of women's colleges in the United States was forecasted by Shannon (1971). The future of teacher education was investigated by Clark (1971). Opportunities and trends in physical education were determined by Takovitch (1976). Ideas about changes to be brought about in the future of a school of business were generated by Stage (1976).

Technical Rationality: Curricular Decisions

Technical rationality was defined by Deising (1962) as the efficient achievement of a single goal, such as that observed in production where work was directed toward the

means. This is the use of the Delphi method to determine curricular change and content.

The literature from 1966 to 1978 was reviewed. The study was not exhaustive, but 19 different subjects and disciplines were investigated, using the Delphi method, in that period. The researchers, date, and any specialization undertaken were listed in table two. Judd (1972) reviewed the literature, noting that goals were studied in a generalized way, at the regional and state wide level, and at the university and individual college level.

Economic Rationality: Goals and Objectives, Evaluation and Competencies

Economic rationality was described by Deising (1962) as the maximum achievement of a plurality of goals, such as those observed in measurement and the establishment of values, where work was directed towards the ends. This is the use of the Delphi method to determine the goals and objectives of education at the university, college and discipline level, the use of evaluation to measure achievement of the goals, and the use to determine the competencies required of graduates.

Goals and Objectives

Peterson (1970) observed that the primary goals of a university were to provide an environment in which the faculty and students can discover knowledge; examine knowledge critically; preserve and transmit knowledge,

wisdom, and values that will enable the present and future generations to survive and exist with an improved quality of life. General education in community colleges in Florida should provide a study of the use of language, an appreciation of the culture, how to learn, and how to solve problems stated Smith (1975). Beacham (1976) studied change and the effect it has on post-secondary education. He found inadequate long range planning and a need to examine the mission and objectives.

Evaluation

The earliest evaluation study noted was that of Reisman and Taft (1968), who determined faculty merit for publications, public and community service. Dowell (1975) determined priorities for tenure and collective bargaining. Yoda (1973) determined a systematic method to evaluate faculty performance for promotion, merit increases and tenure.

Cochran, Crumley, and Overby (1970) determined the characteristics of a good teacher or professor. Fox and Brookshire (1971) identified the categories for effective college teaching as personal characteristics, professional qualities, interpersonal relationships, technical skills and teaching, and communication skills.

Priorities for research and development needs were evolved by Delphi studies conducted by Veal (1976) for the Florida State University Laboratory school, by Hughes (1975) and Mitchell (1971) who included planning for space.

Evaluation studies of community colleges included the Brooks (1972) study in which the most successful vocational programs were identified and Dagenais (1974). Hopkins, Ritter and Stevenson (1972) determined priorities for vocational education in community colleges.

Garth (1975) evaluated the function and status of programs in teacher education where the students were predominantly black.

Smith (1974) measured the affective change that occurred during sensitivity training at the graduate level.

Competencies of Graduates

The more recent Delphi studies have concentrated upon the competencies of graduates. Bunning (1976) and Rossman and Carey (1973) determined the skills and knowledge required by an adult educator. The five main skills identified by Bunning (1976) were to diagnose needs, self-improvement, to communicate, to encourage creativity, and to be a competent instructor. The five main knowledge competencies are to understand change in humans, self-understanding, to know the change process, to identify principles of adult education and to comprehend learning theory.

Cox (1975) named the project FOLLOW Up and determined the characteristics of students leaving community colleges.

Subject areas studied to determine competencies include counselling, home economics, music, and teacher

educators. Lechowicz (1974) defined behavioral objectives for the training of group counsellors. Recommendations from the American Home Economics Association (1973) included competency based education for undergraduates and graduate programs in home economics. One of the competencies for graduate programs was administrative training that emphasizes leadership and communication. Specialized training for those home economists who work in developing countries should include both adapting at the grass roots level and the administrative level. Rainon (1975) produced a hierarchy of competencies for student teachers of music. Buff (1975) developed a list of the competencies required for teachers.

Tagschal (1978) noted that developments in electronics makes knowledge available to all persons. The need now is information about how to gain access to stored knowledge, how ^{to} survive in a technological world, and how to think critically.

Legal Rationality: Concerns of Faculty and Students

Legal rationality included decisions related to morals and status where there might be a difference of interest, where hierarchies were evident, where rules were in effect stated Deising (1962). This is the use of the Delphi method applied to concerns of the faculty and students.

Some concerns of faculty were noted above in the section on evaluation. The American Home Economics Association study (1973) included a recommendation that

home economics faculty be more familiar with business. This could be achieved by faculty/ business exchanges. Vance, Magrill and Downen (1977) recommended that library schools require academic credentials to the doctoral degree, including a study of a discipline and library science and library experience. McGovern (1973) explored the expectations that faculty members had about their administrators.

Dowell (1975) studied the reaction of faculty members to student participation in university decisions and found older faculty more positive than younger faculty to including students. Penfield (1975) found the Delphi method more powerful than face to face decision making to develop goals for a student affairs office. Hearon (1971) found that students with experience in the governance of a junior college had broader interests than students who did not participate in decision making.

Political Rationality: Environment and Learning Systems

Political rationality might be substantial , in which individual decisions were related to reorganizing, preserving, or increasing some goal, or functional, in which organizational decisions were directed in the same fashion, stated Deising (1962). Deising related political rationality to power. This is related to the use of the Delphi method to concerns about the environment and learning system.

Critical thinking was applied by Curran (1972) who considered plans for the campus environment that would

improve the quality of life for students. Eckhert (1973) identified the functions of a financial aid office on a campus. Falek (1971) defined the function of counsellors in community colleges. Lipsitz (1972) developed plans for change in a student affairs office. McGill (1974) compared the preferences and discrepancies of different college groups about their interaction with the college environment.

Harold (1975) studied the effectiveness of off-campus programs. Field or internships programs were recommended to prepare home economics students for service to families of all races, income levels and ages in the American Home Economics Association study (1973). Young (1978) found a preference for family studies content to be taught in the informal learning system of the home. The formal system of education was the next preference. The non-formal system represented by counselling and conferences was given last priority.

This last item relates to a Delphi study conducted by the author.

Family Studies Program Development

The purpose of the study was to develop goals and content for a family studies program in a college of home economics and suitability of this content for formal, non-formal, and informal learning systems.

An advisory panel was used to pilot test the questionnaires and to evaluate the product. The

questionnaire was completed by 104 persons in six panels: specialist and generalist experts and in each group experts representing hierarchical, heterogeneous, and homogeneous sections. The response to the three round study was 89.4%, 82.7% and 89.4%. The interval between rounds was 24 days and 26 days. A four point Likert scale was used as a metric.

Round three data were submitted to principal factor analysis with varimax rotation, two way analysis of variance, and Newman-Keuls one way analysis of variance. The Uhl formula was used to test convergence to consensus.

The results of this study showed three major goals for a program in family studies. Thus, the study is an example of economic rationality. The knowledge base for specialization in family studies is that of human development. The particular knowledge areas in human development are health through a study of nutrition; creativity and aesthetic appreciation from courses in design; decisions about the use of resources, goals, and services, through a study of management; skill in business operations and an understanding of morals.

The second goal was identified as an understanding of the communication process, between individuals and between the family and society. The graduates should have communication skills related to the management of food, shelter, clothing and relationships based on a study of natural, and social sciences and the arts and humanities.

The final goal was related to integrative processes. The graduate should integrate knowledge from several disciplines and apply this knowledge to solve the practical problems encountered in everyday life. An understanding of the processes of change and the legal process is necessary.

Colleges are most concerned with the formal learning system. It was found that communication skills, conflict resolution, decision making, interpersonal relationships, living with stress, parent education, values about the family were best taught in the formal learning system.

Communication Competencies

The purpose of a study in progress was to develop goals for communication courses in selected professional colleges, another example of economic rationality. The Delphi method was used to survey graduates from agriculture, engineering, home economics, and pharmacy between 1962 and 1972.

The round one questionnaire had ten open ended questions summarized as: job title; job description; methods used to send and receive messages from professional peers, clients, and the general public; media used; recall of communication courses in college and in inservice classes, and recommendations for the university.

From the responses a list of 22 objectives was designed which was circulated to the graduates in round two and round three. Content analysis was used to prepare

a report for each dean. An abstract was prepared to circulate to graduates.

The graduates were asked to rate the objectives according to a five point Likert scale and to add other objectives. The median and interquartile range were determined and reported visually and statistically to the graduates.

The majority of the respondents from agriculture were farmers, attached to government or conducting research. Oral/ verbal methods were most used except for contact with the public where mass media was most used. Publications were the favorite media. It was suggested that college courses include more practice in public speaking, using audio visual equipment early in the program. Emphasis should be placed on practice in communicating theory in a practical way to farmers.

Engineering graduates were involved in management, construction, and engineering. They utilized the telephone, small group conferences and memos. Unique methods used by engineers, included observation of projects under construction by peers, clients and the public; public hearings; forums; and demonstrations. It was recommended that communication courses include interaction with others. Critical thinking , quick thinking, and willingness to accept responsibility should be encouraged. Work experiences during the summer and a seminar which simulated job situations

were suggested.

Most home economists were engaged in teaching, dietetics, or homemaking. Discussions in groups and at meetings, and mass media were most used communication methods. Unique methods mentioned by home economists were briefs, directories, fashion shows, role playing, tours, food service, samples and teaching kits. It was recommended that the communication classes in demonstration, speaking, display, and broadcasting (radio and television) continue with additional stress on interpersonal communication, business communication. Criteria for grading should include the change shown, confidence and creativity.

Pharmacists worked at dispensing and management. Oral/ verbal methods, especially the use of the telephone were rated high. Media was most used for communication with the public while attendance at professional meetings was the most used channel for messages from and to peers. Suggestions for classes included more use of media, role playing, business communications, public relations and counselling.

Specific objectives will be determined from round three data.

Conclusion

The Delphi method starts with a question about which facts are gathered and statements are made. Then the participants use a metric to state their opinion. In later rounds the participants are asked to join consensus. This description fits well with the description given by Deising (1962) for the decision making structure: establish relationships through discusssion, determine a set of beliefs

or values, and finally, seek commitment of all concerned for these values. It is evident that many organizations, institutions, and managers have found the Delphi method a useful way to make decisions in education, decisions that fit the Deising model of social, technical, economic, legal, and political rationality.

Table 1: Kinds of Delphi Decisions According to the
Deising Model

Deising	Kinds of Delphi
Social	Forecasting
Trends, relationships, roles	
Technical	Curricular
Means	
Economic	Goals
Ends	Evaluation
Measurement, values	Competencies
Legal	Faculty concerns
Morals, status, rules	Student concerns
Political	Environmental
Substantial	
Functional	

**Table 2: Areas Using the Delphi Method to Determine
Goals, Objectives, Curriculum**

Area	Researcher	Date	Specialization
Astronomy	Suggs	1975	Introductory
Business education	Eaves	1976	Administration
	Lill	1973	Marketing
	Newton and Hellenga	1974	Personnel
Chemistry	Hill	1974	Introductory
Community college	Hill	1974	Chemistry
	Delargny	1974	Community education
	Ordolino	1974	Community education
	Przylcylek	1975	Community services
	Masters	1975	Continuing education
	Murphy	1976	Continuing education
	Smith	1975	General
	Rosich	1974	NCHEMS
Dentistry	Malone	1973	
	Stewart	1973	Intramural practice
Economics	Morrison	1973	
Education	Adelson	1967	Teacher education
	Cyphert, Gant	1970	

Table 2 (cont.)

Area	Researcher	Date	Specialization
English	Clark	1971	
Engineering	Randall	1976	
Family Studies	Young	1977	Home Economics
General Institutional Goals	Peterson	1970	
	Judd	1969	Liberal arts
	Uhl	1971	
	Welty	1973	Values
	McLeod	1973	
	Nardoni	1973	Factors affecting
	Huckfeldt, Judd	1974	
	Beacham	1976	
Library	Vance, Magrill, Downen	1977	
Marriage Counsellors	Stevens	1975	
Medical Technology	Crowley	1974	Undergraduate
Nursing	McNally	1975	
	Stead	1975	Role
Outdoor Education	Nadeau	1976	
Physical Education	Lapiano	1974	
Private Institution	Martin, Maynard	1973	
Social Work	Clinch	1973	Components
	Meinert	1973	Policy
	Eure	1975	Core Curriculum
	Faherty	1976	Continuing education

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